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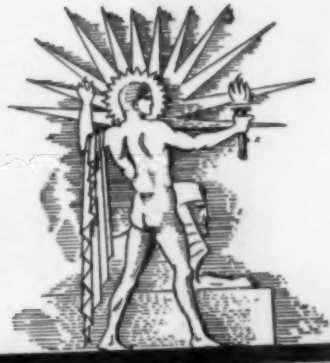
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



SEPTEMBER 26, 1936

With Autumn Rains

See Page 200

A SCIENCE SERVICE PUBLICATION

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The Weekly Summary of

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Edited by WATSON DAVIS

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DO YOU KNOW?

The world's biggest bears were the cave bears that lived in European caves about 50,000 years ago.

Attempts to develop wheat and rye into perennial crops are being made in Russia.

Gothic architecture is traced to Persian origin by archaeologists exploring Persian ruins.

Improving fruit by the grafting method was hailed as a new science in the days of ancient Rome.

Great Britain's 12 most popular national monuments are proving to be six famous castles, five abbeys, and Stonehenge.

Death of trees injured by illuminating gas has been prevented experimentally by pruning off the injured parts of the roots.

The newest steam-electric locomotive lacks two of the familiar features of old steam locomotives—the side-rod drive and the water tower.

Harvested fruit keeps longer in storage or market if it is removed quickly from the sun and kept cool.

The Russo-Japanese War was the first war in which disease did not kill more men than battle wounds.

Zinnias are extremely susceptible to X-rays and die when exposed to dosages that are seldom lethal to other plants.

An ivory rod found in ruins of Lachish, Palestine, is believed to be a hair curler of the sort used 3,200 years ago.

The giant Sequoia tree of the West has a much smaller cone than many cone-bearing trees that do not reach nearly so large a size.

Durability of paint applied to wood depends considerably on the substances, such as rosin and oil, that are drawn out of the wood.

Cotton growers in Arizona are plagued by a growth disorder of the cotton plant called crazy-top, which seems partly due to times of water shortage.

WITH THE SCIENCES THIS WEEK

Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.

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PUBLIC HEALTH

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What should you do if infantile paralysis attacks your community? p. 199.

RIVALS FOR AGE DISTINCTION

The skull at the left, recently excavated, may prove to be the remains of the most ancient man in England, removing that distinction from Piltdown Man. A restoration of Piltdown Man, from the National Museum of Washington, is shown at the right.

ANTHROPOLOGY

Skull Just Found in England May Be of Oldest Englishman

Discovery in Old Thames Valley of Bones Believed To Be 180,000 Years Old Provides Rival to Dawn Man

MERRIE ENGLAND's oldest inhabitant, 180,000 years old, has been dug out of the ancient Thames Valley, near London. It is a human skull dug from river gravel 24 feet underground, by its discoverer, Dr. Alvan T. Marston, London dentist and archaeologist.

High importance is assigned to this forerunner of modern man who is coming to light in a succession of discoveries. The newest find, the left parietal bone of the skull, reveals how the top and sides of the ancient man's head were shaped.

From examination of the skull as it can now be fitted together, Dr. Marston pronounces this individual a creature of the Old Stone Age, definitely earlier and more primitive than England's famous Piltdown Man.

Piltdown Man is thus pushed down into second place among England's oldest inhabitants.

When Burial Was Unknown

The Stone Age man now coming to light belonged to a stage of culture so early that man had not yet learned to bury his dead. It is only some fortunate chance that enables searchers to find part of one of these rare skeletons, and perhaps, if very fortunate, to extract from the earth nearby some of the stone weapons that the primitive fellow and his associates had used in hunting. Such weapons, and bones of animals of the time, are highly valuable clues to the era when the individual was alive.

The discoveries by Dr. Marston have been made in gravels of a 100-foot Thames terrace at Swanscombe, in Kent. The bones are fossilized, and are described as in a remarkable state of preservation. Enough of the skull is now available, Dr. Marston has reported, to permit of precise measurements of many features of the ancient man's skull and brain.

Scientists Argue Over Skull

Dr. Marston's discoveries, now being reported to scientific journals, add new fuel to the long, hot controversy over the age and character of England's oldest specimen of man.

Fragments of the curious skull found at Piltdown in 1912 have heretofore been accepted as "England's oldest," but the skull has been a bone of scientific contention ever since it came into the limelight.

So ape-like was the jaw of the Piltdown Man that scientists dubbed him Eoanthropus, meaning the Dawn Man. Some anthropologists have considered that this Dawn Man must have been almost as old as that grandfather of all ancient men, Pithecanthropus, the Ape-Man of Java. And some who examined the Dawn Man's fragmentary remains said he might be an earlier type of creature than even Pithecanthropus himself.

Date Shifted

Other scientists argued from other clues, and pointed out that the Dawn Man had a good forehead and that they refused to believe he ever made the crude stone implements found near him and thought to be fitting tools of a Dawn Man's clumsy fingers. England's Dawn Man, these scientists said, was old, indeed, but more of a man and perhaps 100,000 years or so younger than the most radical theorists believed.

The age when the Dawn Man of Piltdown lived has thus shifted back and forth, with the tide of theories, between 100,000 and 300,000 years ago.

Now, Dr. Marston enters this controversy with the declaration that his Stone Age discovery was a man of the same general type as the Piltdown specimen, but earlier and more primitive. And the age of the new contender for first inhabitant of England is judged to be no earlier than 180,000 years ago. This is based on the tools found near the bones.

Remarkable Patterns

These tools have been referred for examination to the noted French archaeologist, Abbé Henri Breuil. He classes them as the kind of stone craft achieved by men in the Acheulean period of the Old Stone Age. When Europeans made the Acheulean type of tool—named after the place in France where these tools were first found—the Stone Age was still extremely primitive and savage, but men had learned to use their hands to make good stone tools and weapons.

The verdict that the new Dawn Man lived no earlier than about 180,000 years ago would lend support to the faction of scientists who have considered Piltdown Man not extremely ancient and ape-like. However, even robbing the British Dawn Men of evolutionary crudeness still leaves them distinction. They are being revealed as very early and remarkable patterns of humanity, patterns which appear to have been discarded before Homo sapiens, the modern type of man, began his spectacular rise toward civilization.

ASTRONOMY

Ultraviolet Window Admits One Wavelength to the Earth

American Astronomical Society Learns That These Rays Are Harmless; New Star's History Is Now Reported

ULTRAVIOLET LIGHT, at apparently full solar force, pours on to the earth without let or hindrance at one particular wavelength band, yet works no more mischief on us than do the other ultraviolet wavelengths that are partly curtained off by gases in the earth's atmosphere, particularly the thin layer of ozone high above our heads.

This ultraviolet window, as it has been termed, has been studied by Dr. Orren Mohler of the Cook Observatory, Wynnewood, Pa., who reported at the meeting of the American Astronomical Society, in session as part of the Harvard Tercentenary Conference.

The ultraviolet radiation that thus breaks through a gap in the earth's defenses lies in the band between 2,000 and 2,300 Angstrom units—well out toward the shorter wavelength end of the invisible spectrum. Dr. Mohler conducted his studies with a special instrument called a photoelectric Geiger-Mueller counter working near sea level. A previous investigation had been made in Switzerland by a party of scientists who climbed up a lofty mountain to break through the ozone. Dr. Mohler's results, which yielded more complete data than those obtained by the Swiss party, have shown that such laborious effort and considerable expense are not necessary for the study of ultraviolet radiation.

New Star's History

Particulars regarding the "new" star, Nova Lacertae, which burst into celestial prominence last June 18, were reported for the first time, by astronomers who have spent the intervening weeks in their careful study.

The explosive outburst of this star threw off four distinct shells of glowing gases. Two of them travelled outward at a rate of 3,500 kilometers a second, and two others reached a maximum of well over 2,000 kilometers a second. The distance of the star is 2,600 light years. The parts of the star that give off visible light have temperatures of from seven to ten thousand degrees Centigrade, while its ultraviolet radiation indicates an extreme temperature of 64,500 degrees.

Among the astronomers reporting on the nova were Drs. N. T. Borrovnikoff and J. A. Hynek of Perkins Observatory. Dr. D. B. McLaughlin of Michigan University, Dr. R. K. Marshall of the Mount Wilson Observatory and Drs. J. A. Pearce, C. S. Beals, R. M. Petrie and Andrew McKellar of the Dominion Astrophysical Observatory of Victoria, B.C.

Movie of Solar Events

Before the annual dinner meeting of the American Astronomical Society, motion pictures constituting the first continuous record of events on the sun were shown by Dr. Heber D. Curtis of the University of Michigan. These films, which were made in the new solar tower of the McMath-Hulbert Observatory at Lake Angelus, Mich., show such magnificent fireworks as vast solar flames leaping out more than one hundred thousand miles from the sun's surface at velocities of a hundred miles a second. "Roman candle" spurts 300 miles through the 1,000 miles long, and tremendous arches of luminous gases "playing leapfrog" with each other.

Science News Letter, September 26, 1936

ETHNOLOGY

Diary of Artist Becomes Good Scientific Document

A BALTIMORE artist, Frank Mayer, who roved among Indians of Minnesota back in 1851, has left to science an important record of Indian life in those days.

His three-volume diary, kept for his own reading, is pronounced one of the most valuable records written about American Indians, by no less an authority than Dr. Clark Wissler, anthropologist of the American Museum of Natural History. The yellowed pages came through the great Baltimore fire of 1904, and emerged charred and much damaged. Now, in the American Museum, anthropologists have succeeded in deciphering the day-by-day account in one of the volumes.

When young Mayer journeyed west of the Alleghenies to sketch the people and the country, he found Minnesota Indians living in wild and unsettled territory. From pages so far deciphered, Dr. Wissler says:

"The author's description of daily life and the songs and dances of these people is extremely well told, as are the recordings of the songs which are translated phonetically."

Dr. Wissler finds especially interesting, an account in which Mayer told of peeping through a hole in an Indian tipi and observing mysterious ways of an Indian doctor of the Dacotah tribe treating an aged patient.

The diary, quoted here with some omissions, records the scene: "Grouped around a smouldering fire, their forms and features rendered indistinct by the light of a candle which they had borrowed from the neighboring house, the octogenarian mother-in-law of my host covered by a blanket. Her daughter, one of the handsomest of the Sioux women, was her attendant and sat at her side. Gray Leg (the doctor) sat opposite, smoking and chatting. A rattle made of a gourd with a few beads within and bowl apparently containing water was near him.

"He divested himself of his blanket and laid his pipe by his fan which served him in the heat of the day to remove flies and stir the sultry atmosphere, and taking the rattle in his hand, he began his incantations. Approaching the patient by degrees while singing his song, all the time using the rattle to a certain extent in harmony with the measure and sentiment of his song, now fast, now slow, now shaking it and now giving it a rotary motion. Standing up, he pronounced a short speech addressed to the intruding spirit and continued his rattling.

"The doctor applied his mouth and then his ear to the patient's ear and temple and, as though endeavoring to scare away the animal within, he imitated the bark and grunt of a dog or some animal in pursuit."

Whether this treatment was going to succeed, Mayer did not learn, for the patient was removed to more comfortable quarters at the interpreter's house.

So far as Dr. Wissler can learn, Mayer's diary has received scientific publication only when a portion appeared in a paper of the Minnesota Historical Society.

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PLANT PHYSIOLOGY

Progress Toward Synthesis Of Chlorophyll Is Reported

THE mystery of plants' ability to capture sunlight and use its energy in forming food for all the world has been brought several steps closer to final solution by a German holder of the Nobel prize, Prof. Hans Fischer of the Munich Technical College.

At the meeting of the Harvard Tercentenary Conference, Prof. Fischer reviewed his long researches on chlorophyll, the green synthesizer in plant leaves and stems, and told of its recent progress.

The ultimate aim is the synthesis of this complex molecule, which will enable scientists the better to understand and control the vital processes of plants. Chlorophyll synthesis has not yet been accomplished, but Prof. Fischer intimated that he hopes to get it done in the not too far distant future.

Of perennial interest to physiologists and chemists is the relationship between the green pigment of plant leaves, chlorophyll, and the red pigment of blood, hemoglobin. A hemoglobin molecule consists of a huge lump of a protein molecule with four porphyrin rings attached, each with a single atom of iron at its center instead of the chlorophyll's single magnesium.

The chemical basis of chlorophyll is a four-sided arrangement of carbon and nitrogen atoms, called the porphyrin ring. With some extra groups of atoms attached around the outside, one long atomic chain called the phytyl alcohol group tacked onto one corner, and a single atom of magnesium stuck squarely in the center, the porphyrin ring becomes the chlorophyll molecule.

Prof. Fischer's award of the Nobel prize was a recognition of his monumental researches on the chlorophyll problem.

A quite different group of physiological compounds, also built around rings of atoms, was discussed by Prof. Leopold Ruzicka of the Zurich Technical College, Switzerland. Prof. Ruzicka has succeeded in making artificially several male sex hormones, including compounds never produced in nature. Some of these are very much more powerful than the natural substances when used on experimental animals but this is no indication that they would have favorable results if used on human beings. They have not yet been tried clinically.

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FOR CANDID PHOTOGRAPHY OF THE SKY

Prof. Charles H. Smiley of Brown University's Ladd Observatory (right), is directing the grinding of an f/1 lens-mirror system for the Schmidt type camera by his assistant, Donald S. Reed. It was with a Schmidt camera that astronomers of the University of Chicago and the University of Texas recently discovered the "coldest" star known to science. It has a wide field of view and a great light-gathering power. (See SNL, Sept. 12, p. 164.)

ASTRONOMY

"Coldest" Star In Universe Found By Chicago Astronomer

WHAT is probably the "coldest" star yet discovered by astronomers has been found by Dr. Charles Hetzler of Yerkes Observatory of the University of Chicago, it was announced by Dr. Otto Struve, director of the Observatory.

The phrase "red hot" to most folks means high temperature but in stars redness is associated with relative coolness, pointed out Dr. Struve. The stars discovered by Dr. Hetzler are redder than any previously known, and cannot be photographed in ordinary blue light.

While most stars have temperatures between 3,000 and 30,000 degrees, with a few "hot" ones at 50,000 degrees Centigrade, the new Hetzler stars have temperatures estimated at 1,000 degrees and below.

Use of special new infra-red sensitive photographic plates made possible the discovery. Five-hour exposures on the 24-inch Yerkes reflecting telescope were necessary to obtain the newest astronomical finding.

The discovery of very faint stars closer to the earth and sun than any now known was predicted, following Dr. Hetzler's report.

At present the known star closest to the earth is Alpha Centauri whose light takes four and one third years to reach the earth. An immediate search for small faint stars that may be closer is planned by Dr. Hetzler.

The new "heat-seeing" photographs are also expected to result in the discovery of more comets and asteroids, the small fry of the solar system which escape the astronomers' eyes and ordinary photographic observation.

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In Switzerland, over three-fourths of the railroad mileage has been electrified.

MEDICINE

Fight Cancer by Inducing It Is Suggestion in Vienna

New Line of Attack Would Involve Developing Of Method Like Vaccination for Producing Immunity

A NOVEL and daring line of attack on cancer—a sort of vaccination—is suggested by Dr. Sigismund Peller of Vienna.

Reduce cancer deaths by causing more cases of cancer, is the paradoxical suggestion he makes in a report to the *Lancet* (Sept. 5).

By deliberately inducing cancer of the skin, and then curing it, Dr. Peller believes the present high mortality from cancer can be reduced. The idea is something like vaccination, the method of giving a mild attack of cowpox to avoid a possibly fatal attack of smallpox.

Dr. Peller's suggestion has not yet been tried. It is presented to fellow scientists for consideration in their plans for future campaigns against cancer. It would not help, of course, those already suffering from cancer. If cancer does not yield to present methods of attack, some bold disease fighter may decide to follow Dr. Peller's suggestion, rash though it seems at present.

Local Treatment Needed

Whether or not Dr. Peller is correct, all the evidence at present, as the editor of the *Lancet* points out, is in favor of treating cancer locally, at whatever place it may appear. It is to be hoped that Dr. Peller's theories, promising though they may sound, will not make doctors or patients doubt the need for treatment, by surgery, X-rays or radium, at a stage when cancer is still localized.

Dr. Peller's theory is that cancer is a general disease which may appear anywhere. The particular spot on the body where it does appear depends on some local irritating factor. If the irritation is applied to the stomach, for example, cancer will develop in the stomach, but other parts of the body will escape. One way to fight cancer, it follows, would be to prevent irritation which could start the local development of the general disease. This has been attempted, without much success, because so little is yet known of the various irritating factors which may start cancer.

Consequently, Dr. Peller suggests the alternate line of attack. Assuming that cancer will develop somewhere, perhaps in an inaccessible spot where it cannot be detected until too late to cure it, make it start, by suitable irritation, on a place like the skin where it can be detected at once and cured. This, in Dr. Peller's opinion, would lessen or prevent the likelihood of cancer developing on some part of the body where it cannot be so successfully treated.

The results of such a daring procedure cannot be foretold on the basis of present knowledge, the editor of the *Lancet* points out. Studies of animals have shown that cancer of the skin is not likely to develop if breast cancer is present, and breast cancer is not likely to develop when the animal has a skin cancer. The records do not show whether this antagonism holds true for other organs of the body, as Dr. Peller assumes may be the case.

The heroic method of using human guinea pigs is fortunately not needed to answer this question, since there is material available in the form of persons who have suffered from skin cancer and been cured. A careful inquiry into their subsequent histories, the *Lancet's* editor says, would show whether or not they have later been attacked by cancer in other organs more frequently or less frequently than their contemporaries in the rest of the population.

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ENGINEERING

Trees Cut Fuel Cost When Used as Windbreak

IF YOU own a home, trees can be something more than a source of firewood or shade. They will save on winter fuel if used as a windbreak, reports W. K. Williams of the U. S. Forest Service. When cold winds reach a velocity of more than 20 miles an hour it is found that an unprotected house needs three times the heating requirements of a tree-protected home.

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CULTURE LINK

This bull with a humped back was an animal that did not exist in Mesopotamia, and so his image found there indicates contact with India in ancient times.

ARCHAEOLOGY

Humped Bull Links Ancient India and Mesopotamia

A 5000-YEAR-OLD picture of a bull with curving horns and a monstrous hump on his back, unearthed in Mesopotamia, is important archaeological evidence, linking two of the world's great ancient civilizations—India and Mesopotamia.

The humped bull pictured on a green steatite vase has been found in ruins of Tell Agrab, old Mesopotamian city, Prof. Henri Frankfort, director of its Iraq Expedition, has just reported to the Oriental Institute. Since the humped bull was not a native beast of Mesopotamia, but was a familiar figure on the art of India in that day, the pictured animal is considered good evidence that a close relationship between India and Mesopotamia existed.

Another fragment of the same Mesopotamian vase is decorated with a picture of a Sumerian with large hooked nose, typical of the people living in Mesopotamian cities in 3000 B.C. Thus the vase combined in its art a picture of a native inhabitant and a foreign animal.

The land that lay between Mesopotamia and India was far less arid in ancient times than today, Prof. Frankfort pointed out, and he believes travelers went from one center of civilization to the other both by land and by sea.

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PUBLIC HEALTH

Trichinosis Ten Times as Common as Has Been Supposed

Symposium On Infectious Diseases Also Hears That Maternal Extract Protects Against Children's Ills

TRICHINOSIS, a painful and sometimes fatal disease contracted through the eating of infected pork, is fully ten times as common as has hitherto been supposed. Not two per cent, but twenty per cent, of population samples studied had suffered from the malady at some time in the past.

This rather startling state of affairs in the nation's public health was revealed by Drs. Donald L. Augustine and W. W. Spink, of Harvard Medical School, at a symposium on infectious diseases, part of the celebration of Harvard University's third century of life. The figures are based on recent dependable studies of autopsy material in Boston, Minneapolis, and Rochester, N. Y.

Recent studies in his own laboratory have convinced Dr. Augustine that the commonly used diagnostic methods, of looking for the parasitic larvae in blood, spinal fluid, and body wastes, are a waste of time, and that microscopic examination of bits of the patient's muscle is of doubtful value. Far better, he declared, is a serological test which he has devised, using the parasites themselves to prepare an antigen. This method is specific for this one disease, except the skin tests when used in patients hypersensitive to other proteins.

Maternal Extract Protects

Measles in young children can be at least temporarily staved off, and other diseases of childhood mitigated, by an extract of the placenta, Dr. Charles F. McKhann of Harvard Medical School reported to the same symposium.

Dr. McKhann regards his discovery merely as something that will be useful for the time being, for the ultimate aim is to develop a satisfactory method of active immunization that will confer more lasting protection.

"Because the immunity conferred by the extract is passive and thus of short duration," he said, "modification of the disease with the resultant possibility of permanent immunity is to be desired in normal healthy children, whereas in sick, debilitated, or very young children complete protection should be obtained if possible.

"Placental extract appears to be at least as efficacious as convalescent serum and escapes the most serious drawbacks of the latter, in as much as it can be prepared on a large scale and can be partially standardized as regards activity."

The extract has one drawback, with certain individuals at least, causing sharp local reactions after injection. Administration by mouth is therefore being given a trial, and there are some indications that this method may result at least in modification of measles.

Varied Protection

In addition to the measles antibodies, the extract contains diphtheria antitoxin, substances neutralizing the virus of poliomyelitis or infantile paralysis, a substance that lyses or dissolves the dangerous streptococcus organism, and an antibody that blanches scarlet fever rashes.

Given intramuscularly or by mouth to children who are susceptible to scarlet fever, the extract is capable of rendering them negative to the Dick test for periods up to two and one-half weeks. This means that for that long at least they are immune to this dreaded malady of childhood. Further studies of the usefulness of the extract in preventing scarlet fever are now in progress.

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PUBLIC HEALTH

Health Officers Queried About Polio Protection

WHAT to do about infantile paralysis continues to worry not only parents but physicians and health officers. While the laboratory scientists are at work on the problem, searching for effective means of controlling this childhood scourge, those responsible for children's health and welfare wonder how they can best protect their young charges from the disease. Whether to vaccinate, to spray, to close schools are some of the unanswered questions.

A committee of the Essex County Health Officers Association of New Jersey tried to find the answer to these questions by sending a questionnaire to a group of city health officers throughout the United States.

The answers they received, as reported in the current issue of the *American Journal of Public Health* (September), show a wide variety of opinion. Some health officers frankly said that so little was known about the disease that they were reluctant to commit themselves.

On two points there was general agreement of opinion. One of these was that the infection enters the body through the upper part of the nose and pharynx—the space back of the nose leading toward mouth and throat—and that the virus of the disease reaches the individual by direct contact, usually through sneezing, coughing, kissing and droplet infection.

The other point generally agreed on was that all infantile paralysis patients should be sent to hospitals because this gives the patient a better chance for recovery and also avoids alarm throughout the community.

After considering the answers to their questionnaire and other medical opinion, the Essex County committee drew up a set of eight regulations which they believe to be the best practice at present. While these are only in force in Essex County, other communities may wish to consider them. They are as follows:

Rules of Best Practice

1. Hospitalization of all cases is advised.
2. Immediate report by physicians to the local health department of all cases of paralysis, as well as those showing fever, headache, vomiting, and stiffness of the neck is urged.
3. Services of a diagnostician should be available when possible.
4. The opening of schools should be postponed during an epidemic.
5. Playgrounds should be closed or else used for separate classes during recess periods, with no mixing of grades.
6. Swimming pools should be kept open but regularly chlorinated during epidemics.
7. Contacts under 16 should be put under observation for at least 14 days.
8. The public should be advised against allowing children under 12 years of age to attend circuses, fairs, picnics, and movies.

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MEDICINE-PHYSIOLOGY

Predict Epileptic Seizures Through Brain Waves

EPILEPTIC seizures have been successfully predicted by means of brain wave studies at Harvard Medical School, it was disclosed for the first time at a symposium on the nervous system and its disorders, conducted as part of Harvard University's Tercentenary.

The announcement was made by Drs. F. A. Gibbs and W. G. Lennox, members of the Harvard medical faculty. They stated, in summary:

"By studying the electrical activity of the brain we are making good progress toward understanding the underlying disturbance which causes epileptic seizures. But until recently we have learned nothing that would be of immediate help to epileptics.

"In the last hundred days, however, we have been taking daily fifteen-minute records on a patient who has frequent convulsive seizures, usually one, sometimes two a week. We have found that in this case the electrical activity of the brain changes markedly as much as 18 or even 24 hours before a seizure.

"If we can predict seizures in one patient, the first we have studied with this in mind, we can probably do the same for others. If a patient could tell the day on which he was to have a seizure he would be relieved of the fear of having one in an embarrassing or dangerous situation. Furthermore, if one can tell when a seizure is about to occur, it should be possible in many instances to give a sedative drug in sufficient dosage to prevent the seizure."

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PHARMACY

Drug Stores to Swing From Present Hodge-Podge Style

THE "GENERAL STORE" type of drug store which handles everything from epinephrine to plain and fancy radios is on the way out, according to Dr. A. R. Bliss, Jr., dean of the School of Pharmacy, Howard College of Alabama.

Better conditions for the pharmacy profession, including cultural conditions, a higher type of professional pharmacist, and a definite salary increase are seen by Dr. Bliss as a result of the increasingly strict educational requirements for practicing pharmacists.

Two kinds of specialized stores will take the place of the old drug store, he said. One group, with specifications probably set by the state boards of pharmacy, will carry on the professional functions of pharmacy.

"The most important of these functions is, of course, the compounding of prescriptions. Others are the handling of poisons, narcotics, and other drugs, the sale of medicines as a whole, the sale of sickroom necessities, and acting as a first aid station.

"I doubt if the stores in the other classification should be called drug stores. They will sell package goods and sedentary lines," Dr. Bliss explained.

The Howard College pharmacologist said a start has already been made in this direction in that there are state laws which reserve the name "pharmacy" only for stores which employ a registered pharmacist.

In predicting better conditions for the pharmacy profession, he said: "Graduates of four year courses in recognized colleges will not be content to work under the old conditions which correspondence school pharmacists work under."

"There is a willingness of most authorities," Dr. Bliss said, "to recognize that modern education is worth professional remuneration."

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MYCOLOGY

Fall Showers Bring Forth September Mushrooms

See Front Cover

AS APRIL showers bring forth May flowers, so autumn showers bring forth September mushrooms. In damp fields and moist, leaf-carpeted woods their sudden, elfin appearance causes surprise and mystification, except to those who know that down out of sight the white, webby threads of mycelium have been growing slowly for months, sometimes for years, and that the now fast-expanding fruiting bodies were ready in the "button" stage long ago.

Among the most interesting, yet most common, of autumnal mushrooms is the elm fungus, *Pleurotus ulmarius,* that puts forth its really graceful clusters of thickish, creamy-white fans, ribbed underneath, from dead logs and stumps of the elm, and sometimes from branches of the living trees. This mushroom can be eaten freely without fear of ill consequences. It is well-flavored.

The photograph on the front cover of this week's SCIENCE NEWS LETTER is by Cornelia Clarke.

Science News Letter, September 26, 1936

IN SCIE

PHYSIOLOGY

Body Mobilizes Vitamin A When Fighting Infections

VITAMIN A seems to play a part in overcoming infectious diseases, research by Drs. S. W. Clausen and A. B. McCord of the University of Rochester Medical School show.

This has long been suspected from the fact that persons whose diets are lacking in this vitamin are liable to infection. Now the Rochester researchers find that the body mobilizes its vitamin A like part of a defensive army when called on to fight disease.

The vitamin, found in carrots, apricots, other vegetables and fruits and cod liver oil, is stored in the liver in man and other animals. When albino rats are sick with a disease known as mouse typhoid fever, part of the vitamin A disappears from their livers, and an increased amount of this vitamin is found in their adrenal glands, Drs. Clausen and McCord found.

A similar reaction appears to occur in patients suffering from pneumonia. During the acute stages of the disease, the concentrations of vitamin A, carotene and xanthophyll, closely associated substances, in the blood are very low, but after the crisis the amounts of these substances steadily increase. About the tenth day after the crisis, the concentration of vitamin A suddenly rises to a peak far above the average before returning to normal within a few days. Again it seems as if the vitamin must be called out to aid in the recovery.

Much the same changes in the amount of vitamin A in the blood occur in patients treated by artificial fever, indicating that the fever which accompanies infectious diseases plays an important part in bringing about the changes.

"We feel that vitamin A must play an important part in the struggle of the human body against disease and infection," the Rochester scientists concluded their report to the American Chemical Society. "As a supply of this vitamin in the tissues is exhausted by the fever, more of the vitamin appears to be mobilized from the liver to points where it is most needed."

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EE FIELDS

BIOCHEMISTRY

Cabbage Vitamins Vary As Seasons Change

CABBAGE isn't the same vegetable all the year round, so far as vitamin content is concerned. Experiments at the New York State Agricultural Experiment Station reveal that varieties of cabbage grown commonly for early summer harvest are much richer in vitamin C than autumn cabbage.

The summer cabbage is even richer in this vitamin than orange juice, on a percentage basis, the experiments show. Autumn cabbage, on the other hand, contains only a little over half the vitamins in orange juice.

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PSYCHOLOGY

Peace as Natural to Man As Warlike Ways Are

WAR IS NOT a universal and inevitable product of human nature, declares Miss Regina Flannery of the Catholic University of America.

Miss Flannery's researches in anthropology have convinced her that "So far as anthropology can see, peace is just as 'natural' to man as war is. All depends on what man chooses to do with his own nature."

In an essay written for the quarterly journal, *Thought,* Miss Flannery cites her own first-hand observations among the Cree Indians, who live in the "Big Woods" of northern Canada, around the southern end of Hudson Bay. Despite the fact that these Indians are a primitive people who live by hunting (or perhaps because of that very fact) they are "without even traditions of war and without warlike offensive or defensive weapons." Other primitive peoples, widely scattered over the earth and widely diverse in race, are similarly rooted in the ways of peace.

But peace is "natural" to greater cultures and higher civilizations than theirs, Miss Flannery continues, pointing out the predominantly non-military character of both the Chinese and the peoples of India, despite long history of wars in both lands. The Hindus have held up the ideal of peace ever since the rise of Buddhist and Jainist religious philosophies, and the Chinese, who like to crystallize all their thoughts into proverbs, have a saying: "Good iron is not used for making a nail; good man is not used for making a soldier."

Where intense nationalism steps into the picture, whether now or in past centuries, Miss Flannery contends, it is the consequence of what she calls the double ethical code. This code (which of course has nothing to do with the so-called double standard in personal morals) is the tendency among peoples to make their particular set of rules for social conduct valid within the tribe or nation only, with the tacit proviso that "foreigners don't count."

Researches into the terrifically confused tangle of primitive moral and ethical codes, conducted at the Catholic University, have sifted out a sort of "natural decalogue." Interdicts against murder, adultery, incest, theft, malicious lying, cruelty to children, inhospitality, and certain other offenses are worldwide among the most primitive peoples, and have apparently existed as long as the human race has been on the earth.

But at the tribal borders, with many peoples, these rules stop. Hospitality toward the stranger, however, is fairly common, and is the first crack in the wall of the double ethical code. As man becomes more civilized, has wider and readier communications with other peoples in other places, the rift becomes wider, other "rights" are extended toward strangers, and more fellow-humans are included within the circle.

But even yet, the double code, "this graybeard survivor from the days of the caves and river drifts," keeps a tenacious hold on the ways of mankind and only through long and patient effort, undiscouraged by slowness of progress within any single human generation, can men of good will eventually hope to dislodge it.

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CORRECTION

Smithsonian Appropriation Not Made by Congress

UNFORTUNATELY the Smithsonian Institution has not received an appropriation of $200,000 from Congress to continue and extend its studies upon solar radiation variations and their relation to world weather, as stated SNL, Sept. 12, p. 171. The expected appropriation passed the Senate, but died in conference on the urgent Deficiency Bill.

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ICHTHYOLOGY

Making Fish Clean House Is Scheme of Scientists

AN INGENIOUS way of making young trout clean house, that is to say, sweep out the debris in their pond, has been devised in a new type of trout-rearing pond.

By putting the fish to work, the Bureau of Fisheries expects to save considerable time of attendants who have had to scrub the ponds with brooms. The new housecleaning system is to draw off the water in the pond to a low point, introduce a stream of water low in the pond, and then the fish mop up by scurrying over the bottom, carrying the debris with them and dumping it in a catch basin.

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PSYCHOLOGY

Greed for Money Traced To Childhood Indigestion

CHILDREN who cannot digest their food may later develop greed for food and then excessive greed for money, reports the famous psychologist, Prof. Alfred Adler, in the International Journal of Individual Psychology. Many money magnates have suffered from life-long digestive disturbances, he points out.

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CHEMISTRY

Five $2,500 Fellowships In Chemistry to Be Given

THE LALOR Foundation will grant five fellowships valued at $2,500 each in chemistry and related sciences for the academic year 1937-38 it is announced by C. Lalor Burdick, Foundation Secretary.

The awards may be used for research anywhere in the United States or abroad.

The only restriction of the fellowships is that at least one, each year, goes to a research fellow assigned to Massachusetts Institute of Technology since the Foundation is a memorial to the late Dr. Arthur A. Noyes, founder of the physical chemistry laboratory of Massachusetts Institute of Technology.

Appointments are open to both men and women, including professors on sabbatical leave. Applications and information may be obtained from the Secretary of the Lalor Foundation, of Wilmington, Del. Closing date for applications is December 1, 1936.

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PHYSIOLOGY

Chickens Lose Their Brains if New Diet Factor is Missing

A NEW factor in the vegetable oils fed to baby chicks has been found by Drs. Marrianne Goettsch and Alwin M. Pappenheimer of Columbia University's College of Physicians and Surgeons. When the new diet factor is lacking the chicks will literally lose their brains.

They fed pedigreed chicks on a diet which contained all the nutrients and vitamins known to be necessary, yet these birds persisted in ailing. After a short period of normal growth, they would begin to have nervous tremors, to pull in their heads after the manner of sick chicks, and to lose the power of coordinating their movements. Finally they would sink into a stupor which would end in death.

Autopsies all showed the same results. Parts of the brain had become swollen, soft, and wet; appearing either pale or stippled with the blood of many tiny hemorrhages. As the disease progressed, the dead areas became more definite. Parts of the brain were actually being killed as, for some reason, the tiny blood-vessels leading to them were blocked, and blood was prevented from reaching the diseased parts of the brain.

Placed on various diets, the chicks still failed to become healthy, until to their ration was added a vegetable oil. The disease, which appeared only in chicks whose brains were actively growing, was prevented by the addition of corn, cottonseed, peanut, or soybean oils and even the hard, artificially made "vegetable fats." Lard, however, actually seemed to favor the development of the trouble.

Other experimenters suggested that the condition was caused by the lack of an already known vitamin, B_4. But this is soluble in water, which the material found effective by the Columbia researchers is not. So this material is probably a new vitamin.

So delicate is the new food-requirement that only by treating the petroleum ether used to extract it from the oil with sulfuric acid for a number of hours could it be brought to a pure enough state to be used. When this purification process was not carried on, the minute impurities of the ether destroyed the effectiveness of the material.

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PHYSIOLOGY

Garlic Breath War Continues; Yale Insists on Mouthwash

LATEST skirmish in the war on—and about—garlic breath, seems to put the mouthwash adherents on top.

Garlic or onion breath is a local affair, resulting from tiny particles of the odorous vegetables which remain in the mouth, Dr. Howard W. Haggard of Yale University insists in a report to *The Journal of the American Medical Association*. He reaffirms that washing the mouth with a solution containing chlorine will completely banish the offending odor from the breath by chemical neutralization of the odorous substance. Chloramine was first recommended by Dr. Haggard as an anti-onion breath mouthwash, but now he reports finding a dilute Dakin solution even more effective.

The scientific studies which led Dr. Haggard and his associate, Dr. Leon A. Greenburg, to support this view of garlic breath were reported in an earlier issue of the medical association's journal. This brought a prompt counter-attack by Drs. M. A. Blankenhorn and C. E. Richards of the University of Cincinnati. Garlic breath is systemic, they hold, the odor coming from the lungs via the blood which picks it up in the stomach. Mouthwashes, in their opinion, merely mask the odor. As proof of their view they reported experiments in which patients who were unable to swallow were given garlic extracts directly into their stomachs. Hours afterward impartial observers detected the garlicky smell on the patients' breaths though no garlic had been in their mouths. (*See SNL*, Aug. 15.)

Re-entering the fray, Dr. Haggard points out what he considers discrepancies in the Cincinnati experiments. For one thing, the Cincinnati doctors gave their patients extracts from as much as one and one-half pounds of garlic.

"We are willing, indeed anxious, to concede that anyone eating a pound of garlic at one sitting may have the odor in the blood stream as well as the mouth, but our point was and still is that no one eats a pound of raw garlic," he declared.

"The significant point, however," Dr. Haggard says in his latest discussion of the subject, "is the time elapsing between the ingestion of the garlic and the appearance of the odor. If the smell comes from the blood following digestion, minutes or hours must pass before the breath is tainted. This delay is contrary to common experience in eating onions; the characteristic odor appears immediately. In the experiments of Blankenhorn and Richards, some three hours elapsed, even after massive doses of garlic oil, before the odor was detected on the breath."

Yale seems to be winning, but the war may not be over yet. The Cincinnati forces recently gained an ally who reported that he long ago noted a strong garlic odor on the breath of a baby immediately after its birth. He had noted the same odor on the mother's breath during the confinement. Obviously the odor did not reach the infant's breath from garlic or onion particles in its mouth but presumably from the lungs via the blood which, until birth, was supplied from the mother's body. In reporting this, Dr. William Curry Moloney of Jamaica Plains, N. Y., suggests that it should not be hard to find garlic-eating mothers if the Cincinnati doctors wish to continue their studies.

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PHYSICS

"Black as Ebony" Is Not Always Height of Blackness

BLACK as ebony is the height of blackness in literary figures of speech. But botanists at the Field Museum of Natural History, say that real ebony varies from jet black or purplish black to streaked or patchy tones. The ebony woods brought to the commercial world to be made into violin bridges, piano keys, umbrella handles, and other articles range through these dark variations of color.

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ASTRONOMY

Look for Uranus

Far Away Planet, the First Found by Astronomical Science, May Be Seen With Binoculars High in the East

By JAMES STOKLEY

AGAIN, during October, three planets add their brilliance to the evening display of stars. For more than an hour after the sun sets, Venus is visible in the west, brighter than any star or other planet now visible. Next to it in grandeur is Jupiter, in the southwest. About the middle of the month it sets some three hours after the sun.

Much fainter than these, but still of the first magnitude, brighter than most of the stars, is Saturn, over to the southeast, where its steady glow distinguishes it. The accompanying maps, which show the appearance of the skies for 10:00 p.m. October 1, 9:00 p.m., October 15, and 8:00 p.m. October 31, give the location of Saturn. Venus and Jupiter will have set by these hours.

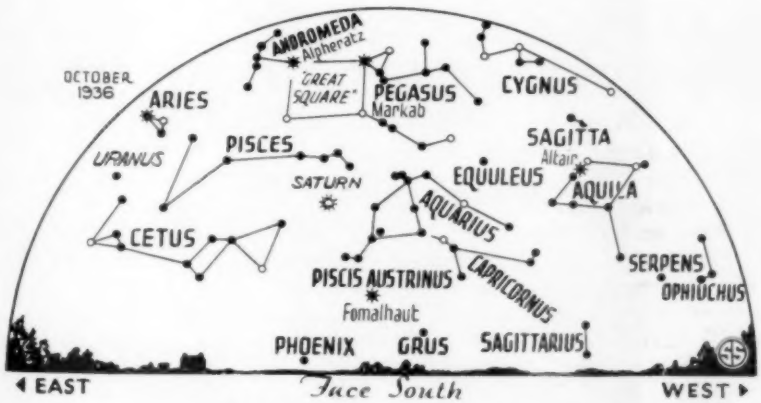
The stars and constellations that are now visible give a taste of what is coming during the winter, for to the east Taurus, the bull, is now in sight. A V-shaped group, now on its side and pointed to the south, outlines the animal's face. A little cluster of stars just above is the Pleiades, known in mythology as the "seven sisters," though it takes a keen eye to see more than six. Next to Taurus, to the north, is Auriga, the charioteer, in which the first magnitude Capella is prominent. These stars, together with Orion, which rises late in the evening, are conspicuous to the south in evenings of January.

Directly south is the star Fomalhaut, part of Piscis Austrinus, the southern fish. This group is connected in a curious way with Aquarius, directly above. The latter represents the figure of an aged man holding a jar from which a stream of water is flowing. The little group of three stars, forming a triangle with a fourth in the middle, is the jar. On the old star maps, this stream was shown to be flowing into the mouth of the fish, surely a strange conception, to have the water in the fish rather than the fish in the water.

Above Aquarius is Pegasus, the winged horse. Three of the prominent stars in this group, together with Alpheratz, in Andromeda, form the "great square," a good mark to know, for from it you can easily find your way to other constellations. Next to Pegasus to the right is Cygnus, the swan, with Deneb as its brightest star. This is at the top of a group sometimes called the "northern cross." Below Cygnus is Vega, in Lyra, the lyre, and near this group, farther south, is Altair, part of Aquila, the eagle.

Under the "great square" is a line of stars that makes the constellation of Pisces, the fishes, and under the easternmost of these is Cetus, a sea monster, sometimes called the whale, though the animal pictured in the old star maps is a horrible beast far different from any that are known today!

The familiar Great Dipper is, in the autumn evenings, at its least conspicuous position of the year, but it can be seen low in the north. This is part of Ursa Major, the greater bear, but the rest of the creature is below the horizon. Above is the little bear, Ursa Minor, which also contains the Little Dipper. At the end of its handle is Polaris, the pole star, always in practically the same posi-



☼ ✸ ○ • SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS

AUTUMN STARS

A V-shaped group of stars low in the east represents the face of Taurus the bull and provides a hint of winter nights to come.

URANUS

In the constellation of Aries, high in the eastern sky, you should search this month for the greenish light of the distant planet Uranus. It is visible, though faint, to the naked eye, but if you first pick it up with the aid of binoculars you will find it easier to locate.

tion in the north, because it is close to the north celestial pole, the point around which the heavens seem to turn daily.

Directly above Polaris can now be seen Cepheus, representing an ancient king of Ethiopia, while his royal spouse is to the right. She is Cassiopeia, and the stars form a letter W on one side. Next to her, and above Auriga, is Perseus, another familiar character in mythology.

First Find

In addition to the three planets mentioned above, a fourth is also in the evening sky at present, but probably few people will notice it because it is just barely bright enough to be seen on a dark night, away from the city's glare, by a person possessed of rather keen eyesight. This is Uranus, the first planet that astronomical science was able to discover. All those known previously had been so conspicuous that the first man who looked at the night time sky could hardly have failed to see them.

About the time that the American colonies were gaining independence, William Herschel, a German-born musician, was living in Bath, England. He had become interested in astronomy but, as good telescopes were expensive, he could not afford to purchase one. He did what many amateurs today are doing, he proceeded to build his own.

By 1781 he had made one, a seven-inch diameter reflector, in which a concave mirror takes the place of a lens in focussing the light rays. Through this he began a systematic sweeping of the heavens, to see what interesting objects he might find. On March 13 he noticed a greenish object in the constellation of Gemini, the twins, that was obviously not a star, because it had a noticeable disk. The stars, even when seen with high-powered telescopes, appear as mere points of light.

Thought a Comet

At first he thought it was some peculiar kind of a comet, and as such it was first announced. But after its motion had been charted for almost a year, Lexell, another astronomer, calculated its path and showed that it was a planet, with an orbit far beyond that of Saturn. Knowing its course, it was possible to tell what parts of the sky it had occupied even before its discovery. Then it was found to have been observed many times before 1781, though not one of the earlier observers had recognized that it was different from a star.

The discovery brought great honors to Herschel, including a knighthood from King George III, and a pension which enabled him to devote his entire time to astronomy. He moved to a house in Slough, not far from Windsor Castle, where his family still resides, among many of his relics, including parts of the greater telescopes that he built later, and with which he made many other important discoveries.

TESTING HIS TENDENCY TO COLDS

New colds susceptibility test has been devised at the West Penn Hospital, Pittsburgh, Pa. When the subject works the bicycle, scientists determine his oxygen consumption, and this is correlated with colds resistance. Dr. Arthur Locke of the hospital is seen operating the device and Miss Rhoda J. Bragdon is adjusting the oxygen mask. (See SNL, Sept. 19.)

On the average, Uranus is a little more than 19 times as far from the sun as the earth, at a distance of 1,782,300,000 miles. Because it is so far out, it moves around the sun very slowly, requiring 84 years to make a complete circuit. The earth's distance from the sun is 92,900,000 miles, so that when we are in the same direction as Uranus it is accordingly closer. Then, as viewed from the earth, the sun and Uranus are in opposite directions. For this reason, the planet is said to be in opposition. This occurs on the evening of Friday, October 30, and at that time Uranus will be only 1,745,030,000 miles away, the closest of the year.

It is now in the constellation of Aries, the ram, high in the eastern sky, as represented on the map. If you have a good pair of binoculars, and you look carefully at this part of the sky with them, you should be able to pick it up, and then, if conditions are good, you may be able to detect it with the unaided eye.

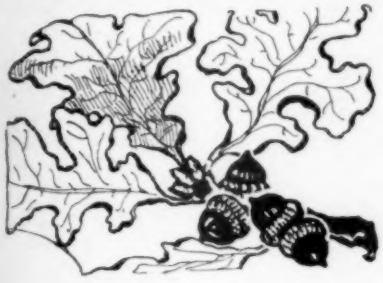
The moon, also, is closer this month than at any other time this year. As it moves around the earth in an elliptical orbit, there is one point each month when it is closest, called "perigee" and another when it is farthest, called "apogee." But because of gravitational pull of many other bodies in the solar system, the exact shape of the ellipse in which it moves varies during the year, and at certain times is stretched out more than at others, and that is true this month. Apogee occurs on October 16, and then it will be 252,650 miles from us, the maximum of 1936. But on the 29th, when at perigee, it will be at the minimum of 221,600 miles.

Phases of the Moon:

		E.S.T.
Last Quarter	Oct. 7	7:28 AM
New	Oct. 15	5:20 AM
First Quarter	Oct. 23	7:54 AM
Full	Oct. 30	12:58 AM

ECOLOGY

NATURE RAMBLINGS
by Frank Thone



The Acorn Crop

OAKS we commonly think of as timber and shade trees only. We know they bear acorns, of course; in some years the ground is so littered with them that they crunch under your feet as they lie on pavement or sidewalk. But they figure simply as squirrel food, in our usual thought—if we trouble to think about them at all.

Nevertheless, acorns are a highly important crop. They figure indirectly in the food cycles of even most civilized peoples. The choicest and most famous hams and bacon, usually produced in limited quantities and sold at premium prices, are very apt to come from acorn-fed hogs. The world-famed Westphalian products furnish an excellent example. Acorns are favorite provender for many species of game animals and the larger wild birds, too; the wild turkey is a great acorn eater.

Acorns, however, do not always get into the human digestive system in this roundabout manner. Primitive peoples, everywhere that oaks grow, are acorn eaters themselves. And in more civilized lands, acorns have been resorted to in times of grain scarcity. They do have a really considerable food value; grains and starchy root vegetables have crowded them out mainly on the score of greater palatability and greater ease in harvesting and preparation.

Of course, there is also the unevenness of the yearly crop to score against acorns as a dietary mainstay. Like all forest trees, oaks have great fluctuations in their annual crop. One year they may carpet the ground, and the next year there may be hardly one acorn to the square yard. Annual crops, like grains and the root vegetables, are commonly more dependable than that.

The wiping out of the primeval hardwood forest in the eastern United States, in which oak was one of the most abundant trees, probably was a considerable factor in the extinction of the passenger pigeon through the breakdown of its acorn food cycle.

When there were very few acorns left, and those competed for in times of a bad crop by every hungry wild thing, it must have meant a great reduction in the number of passenger pigeons. And on the reduced flocks, the guns of hunters, and probably disease as well, worked with deadly effect.

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INDUSTRIAL PSYCHOLOGY

Find Industrial Efficiency Depends on Social Environment

FIVE girls assembling telephone relays at the Hawthorne plant of the Western Electric Company taught scientists that industrial efficiency depends on social conditions of work.

The findings of a study of these girls and another group of workers, and their importance to industrial management, were reported by Dr. Lawrence J. Henderson of Harvard University and Dr. Elton Mayo of Harvard Business School at the opening session of a symposium at the Harvard School of Public Health.

The symposium was devoted to consideration of the effect of the environment on man and was one of the conferences on arts and sciences held in Boston and Cambridge in celebration of the Harvard University Tercentenary.

Most of the symposium was given over to discussion of physical factors of the environment, such as temperature and humidity of the air and air-conditioning; poisonous gases and injurious dusts; air-borne disease; and the germs and hayfever-causing pollen of the air.

These factors affect health, comfort and consequently efficiency. Social factors that are hard to measure and may even be overlooked are nevertheless a very real part of man's environment and have a measurable effect on his efficiency as a worker, it appears from the experiments reported by Drs. Henderson and Mayo.

The five girls, all experienced and expert assemblers, who took part in one of the experiments were observed over a period of five years. They worked in a special room; they were allowed to converse freely; their output was recorded minute by minute and day by day; their conversations, mutual relations, home situations and leisure activities were all noted. The study was made with the consent and cooperation of the girls.

Particularly interesting were the wave-like irregularities observed in output. These waves lasted sometimes for months, sometimes only for a few minutes. They were not related to any change in physical circumstance, such as temperature or the worker's own physical state. The speed of work, however, did vary markedly with changes in the girls' feelings towards each other, towards their supervisors and towards the group as a whole.

A change in seating arrangements, which separated two friends and generally disturbed the neighborly relations of the group, lowered the output. When one of the workers, after several years, left the company and was replaced by another girl, even though the latter had a friend in the group, a disturbance in the group's tone was noted for three months. Drop in output was noted at the beginning of the economic depression. As the leader of the group put it, "We lost our pride." It was also noted that when one girl was dispirited and for this or some similar reason slowed down in her work, her neighbor or best friend also slowed. A reverse effect was noted between two girls who were unfriendly. When one worked fast, the other worked slowly and vice versa.

Another study of a group of men working in the general workroom of the same plant showed again how the social forces in the group affected the work output.

Drs. Henderson and Mayo caution administrators against too many and too rapid changes in work arrangements. These changes may be logically expected to increase efficiency, but if these changes upset the workers' social relations and work routines, they will decrease efficiency because they upset the worker's feeling about his work and the world he lives in.

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PSYCHOLOGY

Politics Gets Recognition As a Branch of Psychology

For the First Time In Its 44-Year History, American Psychological Association Has Session On Politics

AT DARTMOUTH, alma mater of Daniel Webster, politics has received new recognition as a science—a branch of the science of psychology.

For the first time in its long history, the American Psychological Association, meeting at Dartmouth, has devoted a regular portion of its program to papers on politics. And psychologists attending that meeting also gathered in "bull sessions" in the evening and over the luncheon table to discuss plans for pushing research in this new aspect of the science.

A result was the formation of a new scientific society with the alliterative title, Society for Psychological Study of Social Issues. Under the leadership of Dr. Goodwin Watson, of Teachers College, Columbia University, home of so many "brain trusters," and Dr. I. Krechevsky, of the University of Chicago, the new society will act through committees of its members to seek solutions to those problems that beset modern society not alone in politics but in the field of economics and the relations between nations.

One program of research discussed at the organization meeting concerned the causes of war. How is a peace-loving nation led into an international war? Are the psychological factors most important? Or is it more due to pressure from the inexorable forces of geography and economics? Would the psychologist agree with the economist or the physicist or other thinking men who have, however, not made a direct study of human nature as to the part man's "instincts" play in producing war?

Other investigations suggested aimed at the discovery of the present attitude of American citizens toward certain political institutions such as the Supreme Court and the effect education or information has in modifying such attitudes.

Proposed researches must have a majority vote of the society members before they are undertaken with approval.

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PSYCHOLOGY

Democrats More Radical, Psychologist's Test Shows

DEMOCRATS—at least in Akron, Ohio—are more radical in their opinions this year than they were last year, Dr. Ross Stagner, of the University of Akron, told members of the American Psychological Association.

A survey of about 500 residents of Akron indicates that Democratic voters now differ from Socialists so little that the difference is not statistically significant, he said. They are still, however, more like Republicans than like Socialists.

A test of the sort used to measure personality was used by Dr. Stagner to sound out the Akron voters' opinions. Each voter was asked to cross out terms on a list that represented his own dislikes. With 27 political and economic terms such as "Big Navy," "Supreme Court" and "Fascist" were included a few religious terms to disguise the exact purpose of the questionnaire.

That these voters, who are mostly factory and office workers and small business men, dislike both the extreme left and the extreme right in politics is shown by these results: Communist, disliked by 80 per cent; Nazi disliked by 73 per cent; Ku Klux Klan disliked by 90 per cent; Child Labor by 74 per cent. These were the items most disliked. Socialist, however, was scratched out by only 43 per cent.

Constitution and Supreme Court were disliked by less than five per cent of these voters, a significant result in connection with recent decisions of the Court on New Deal legislation. The decision on the AAA and the New York minimum wage decision were then new.

Women voters are more conservative than are men. The only direction in which they showed a more radical leaning than the male voters was their opposition to compulsory military training.

Republicans are distinguished by disliking Communists, Socialists, labor unions, Democrats and strikes. Socialists are principally opposed to the American Liberty League, big navies, Ku Klux Klan, capitalists, and profits.

"Dislike of the three political parties for each other seems to be about equally matched," said Dr. Stagner, "except for the strong tendency of the Republicans to see red at mention of Socialists."

The terms most heavily charged with dislike in this Ohio city include Ku Klux Klan, Communist, Nazi, Soviet, and Fascist. Dr. Stagner comments:

"The usefulness of these terms in political propaganda is easily verified by consideration of their widespread use in the current presidential campaign, applying mostly to individuals and doctrines having no connection with the correct meanings of the terms."

Science News Letter, September 26, 1936

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● RADIO

September 29, 3:15 p.m., E.S.T.

A DOG'S WORLD—Dr. Carl J. Warden, psychologist, of Columbia University.

October 6, 3:15 p.m., E.S.T.

POWER FROM THE SUN—Dr. C. G. Abbot, Secretary of the Smithsonian Institution.

In the Science Service series of radio discussions led by Watson Davis, Director, over the Columbia Broadcasting System.

PSYCHIC MACHINES CAN LEARN AND FORGET

Dr. Clark Hull (right) is "teaching" the machine in the background. Before learning, only one of the buttons will light the light, but after two buttons have been held down together for a time, then the second button alone will light the light. This ability is soon forgotten. The machine in the foreground, operated by Dr. George K. Bennett, is capable of spontaneous unpredictable variability, discouragement, and the human frailty of persisting in error after a correct response is learned and forgotten.

PSYCHOLOGY

Psychologist Offers Proof That Man's Mind is Physical

President of American Psychological Association Shows Machine Capable of Much of Human Behavior

DEMONSTRATING a "psychic machine" which can learn, forget, become discouraged, and show spontaneous and unpredictable variation in behavior, the president of the American Psychological Association told some 750 of his colleagues at the meeting of that Society that the mind of man is purely physical in nature.

Criticizing the British physicist Sir Arthur Eddington for making the statement that "rational man, morally responsible" cannot be reached from a world of ether and electrons, and for failing to offer any supporting scientific evidence for his statement, Prof. Clark Hull, of Yale University's Institute of Human Relations, in his address as retiring president, did furnish to scientists partial proof of his opposing view.

It is a curious paradox, Prof. Hull said, that although Eddington the physicist insists that man's behavior is at bottom non-physical, Albert P. Weiss, renowned psychologist, held that it is fundamentally non-psychological and analogous to the raindrop which "purposes" to reach the ocean. But neither did Weiss present any scientific support for his bald statement.

"This paradox is particularly astonishing in the case of Eddington because he has been active in the field of physical theory and should, therefore, be thoroughly sophisticated regarding the essential methodology involved in scientific theory in general," commented Prof. Hull.

As his contribution to the proof that man conforms to the physical laws of nature, Prof. Hull handed his listeners copies of thirteen theorems reminiscent of geometry in which adaptive behavior is explained without reference to the psychic or to the conception of consciousness. They were based on six postulates relating to human learning and behavior.

If a machine could be built which would display the elementary behavior characteristics represented by these eight postulates, then it would show conclusively that these forms of behavior are at bottom not necessarily psychic, but may be purely physical, Prof. Hull argued.

He then demonstrated the "psychic machines." One was constructed by Dr. Robert Krueger, now of the U. S. Employment Service in Washington, D. C. It can learn and forget and demonstrate many other processes familiar to the experimental psychologist. The second machine goes a step further than the first. Devised by Drs. George K. Bennett, of the Psychological Corporation, and Lewis B. Ward, of Wayne County Training School, Mich., this remarkable machine shows spontaneous variability and the human frailty of persisting in error.

Seemingly fighting a strong tendency to do the wrong thing it will gradually give up in "discouragement" its attempt to do the right.

The machines are simple contrivances in which batteries such as you have in your automobile are rigged up with push buttons and a light. Before "learning," only one button will light the light, but after two buttons have been held down together for a time, then the second button alone will light the light. This ability is soon forgotten and again it is necessary to push the first button. In the Bennett-Ward machine, two lights are originally lighted by separate buttons. But a third button can be "taught" to light either of the lights.

Science News Letter, September 26, 1936

23 LANGUAGES
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•First Glances at New Books

Medicine

ARTHRITIS AND RHEUMATIC DISEASE —Maurice F. Lautman — *Whittlesey House,* 177 p., $2. Here is a book which should be widely read. It gives sane, accurate, helpful information about one of the most widespread and disabling of all the illnesses that plague mankind. The book does not take the place of a physician, but in simple, everyday language it tells the patient and his relatives what arthritis is and what can be done to relieve it.

Science News Letter, September 26, 1936

Psychiatry

THEORY AND PRACTICE OF PSYCHIATRY—William S. Sadler—*C. V. Mosby,* 1231 p., $10. Although simply written, this volume is a technical one intended for physicians. A 35-page glossary of psychiatric terms should add to its value as a reference work.

Science News Letter, September 26, 1936

Chemistry

DYNAMIC CHEMISTRY — Harry C. Biddle and George L. Bush; Edited by William L. Connor—*Rand McNally,* 818 p., $1.80. The use of dynamic in the title of this high school textbook is not an attempt, as might first be supposed, to divide chemistry into the dynamic and static classifications but rather to describe subject matter that is related to the students' daily experience. The subject matter, state the authors, is based on modern sources of materials such as are recommended by the Education Committee of the American Chemical Society.

Science News Letter, September 26, 1936

Engineering

PRACTICAL AIR CONDITIONING—Harold L. Alt—*Domestic Engineering Company,* 259 p., $1. With the growing demand for cooler indoor environment in summer, such information as is contained in this handbook will be in demand.

Science News Letter, September 26, 1936

Physiology

TISSUE IMMUNITY—R. L. Kahn—*Charles C. Thomas,* 707 p., $7.50. Medical scientists will be interested in this presentation of Dr. Kahn's views and studies, but the book is, of course, not for the lay reader.

Science News Letter, September 26, 1936

Education

ADULT EDUCATION IN ACTION—Mary L. Ely—*American Association for Adult Education,* 480 p., $2.25 to members of the Association, $2.75 to others. Containing a large number of condensed versions of articles which have appeared in the *Journal of Adult Education.* The authors include such well-known persons as Nicholas Murray Butler, John Erskine, Charles A. Beard, James Harvey Robinson, and Dorothy Canfield Fisher.

Science News Letter, September 26, 1936

Chemistry

NEW PRACTICAL CHEMISTRY—Newton H. Black and James B. Conant—*Macmillan,* 621 p., illus., $1.80. High and preparatory school textbook which appeals to the student through the dramatic, and by arousing curiosity in common things of everyday existence. At the end of each chapter are three kinds of questions and problems; 1. easy basic questions, 2. advanced questions and 3. numerical problems.

Science News Letter, September 26, 1936

Economics

CASH RELIEF—Joanna C. Colcord—*Russell Sage Foundation,* 263 p., $1.50. Relief of the needy presents a problem which is continuous regardless of economic depressions. This work by the director of the charity organization department of the Russell Sage Foundation should be of interest to all those concerned with assistance of those in need of aid. It is one of a series of "Emergency Relief Studies."

Science News Letter, September 26, 1936

Physics

NEW ELEMENTARY PHYSICS—Robert A. Millikan and Henry G. Gale in collaboration with James P. Coyle—*Ginn,* 637 p., $1.80. Newest revision of one of the most widely used high school textbooks in physics. The subject matter is now so marked that it includes three separate courses of increasing degrees of complexity.

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Education

THE PREVENTION AND CORRECTION OF READING DIFFICULTIES—Emmett Albert Betts—*Row, Peterson and Co.,* 402 p., $2. For classroom teachers.

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Medicine

MEDICINE AND MANKIND—Ed. by Iago Galdston—*Appleton-Century,* 217 p., $2. In this intensely readable book a group of distinguished medical scientists relate the history of medicine from a somewhat different angle than the customary one. Instead of describing or listing important discoveries and advances, the authors tell why and how these discoveries were made, the idea being to give "an understanding of the purposes for which men devote their lives to scientific experiment and inquiry."

Science News Letter, September 26, 1936

Psychoanalysis

PSYCHOANALYSIS EXPLAINED—Dorothy R. Blitzsten—*Coward-McCann,* 66 p., $1. A foreword by Dr. A. A. Brill vouches for the helpfulness of this small volume designed to provide answers for some of the many questions in the minds of laymen concerning this much-talked-of but little-understood field.

Science News Letter, September 26, 1936

Reference Books

UNCOMMON KNOWLEDGE — George W. Stimpson—*Bobbs-Merrill,* 368 p., $2. Using question and answer technic, the author gives factual information on a wide variety of subjects, such as how Tennessee got its name, whether a man can out-travel a horse and who invented the saxophone. The book will delight those of an inquiring turn of mind. An index helps make it the sort of book in which to find the answer to that question which stumped everyone at the dinner party, though the book is not intended to be a complete encyclopedia.

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Medicine

THE AMERICAN MEDICAL PROFESSION, 1783 TO 1850—Henry Burnell Shafer—*Columbia Univ. Press,* 271 p., $3.25. This book will doubtless appeal chiefly to historians and medical men but the general reader with a patriotic turn of mind may be interested in this record of the steps by which American medicine climbed to its present high position.

Science News Letter, September 26, 1936

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